Listed Waterbody: **San Lorenzo River**

Listed Condition: **Pathogens**

Designated Beneficial Uses: Municipal and Domestic Supply (MUN), Agricultural Supply (AGR), Industrial Service Supply (IND), Ground Water Recharge (GWR), Contact and Non-contact Recreation (REC-1 and REC-2), Wildlife Habitat (WILD), Cold Freshwater Habitat (COLD), Migration of Aquatic Organisms (MIGR), Spawning, Reproduction, and/or Early Development (SPWN), Rare, Threatened, or Endangered Species (RARE), Preservation of Biological Habitats of Special Significance (BIOL), Freshwater Replacement (FRSH), and Commercial and Sport Fishing (COMM)

Watershed Location: Santa Cruz County, drains into San Lorenzo River Estuary and ocean

Year added to California's CWA Section 303(d) List of Impaired Waters - 1994

Preliminary Schedule for **San Lorenzo River – Pathogen** Impairment Investigation project

Task	**Completion Date**	**Notes**
Phase 2: Project Plan	December 2003	Active
Phase 3: Data Collection and Analysis Report: Revised Problem Statement	June 2004	*contact staff to submit data
Phase 4: Preliminary Project Report: Numeric Targets and Source Analysis	November 2004	
Phase 5: Project Report	October 2005	
Phase 6: Regulatory Action	Jan./Feb. 2006	

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Problem Background:

Basis for Listing: San Lorenzo River was listed in 1994 for pathogens. The exact data and/or reports used to list this waterbody are unknown, however, data taken by the County of Santa Cruz from 1985 to 1994 do show exceedences of the Basin Plan's bacterial water quality objective[1] for contact recreation from several sampling sites of the San Lorenzo River (see Appendix 1).

Review of data subsequent to listing:

According to the most recent data taken by the County of Santa Cruz from 2000 – 2003 (see Appendix 1 for raw data and graphs), portions of the San Lorenzo River rarely exceed bacterial water quality objectives for contact recreation while some sections of the River fully attain standards.

While there are certain sampling stations that exceed the bacterial water quality objective at various times throughout the year, the exceedences are minimal in both frequency and/or concentration. Analyzing sampling sites from the upper most portions of the watershed to the lower part of the watershed, we see that standards begin to be exceeded at the confluence of Two Bar Creek. There does not seem to be any impairment above this point. Therefore, we can

[1] REC-1:"Fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml."

clarify the listing of the San Lorenzo River to begin at Two Bar Creek. South of this point, as shown in Table 1, the sampling stations vary between not exceeding standards at all and rarely exceeding standards. The listing is further clarified to stop just above the confluence with Branciforte Creek (just southeast/downstream of the sampling site SLR @ Sycamore Grove). Downstream of this site, the waterbody is referred to as San Lorenzo River Estuary and will be addressed under the 303(d) listing for San Lorenzo River Estuary (see San Lorenzo River Estuary Project Plan).

Table 1: Sampling stations in the San Lorenzo River (SLR) watershed listed from the upper watershed, to the lower watershed where the river drains into the Pacific Ocean

Station Name	**Attains standards**	**Rarely exceeds standards**[1]	**Exceeds standards**
SLR @ Waterman Gap	X		
SLR @ Two Bar Cr. (this site is above the confluence of SLR with Two Bar Creek)		X	
Two Bar Cr. @ SLR			X
SLR @ River St		X	
SLR @ Pacific Ave., Brookdale	X		
SLR Above Love Cr		X	
SLR @ Highlands Park	X		
SLR @ Big Trees		X	
SLR @ Sycamore Grove	X		

[1] – This statement means that water quality objectives have generally been attained, but a low frequency (no more than 20% exceedence) OR a low concentration (no more than 2000 MPN, most were lower than 1000 MPN) of exceedences was observed.

Preliminary source analysis: Preliminary DNA ribotyping results[2] performed during the 2002-2003 winter show (see Table 2) in all three sampling sites, humans and birds are the biggest contributors. From a regulatory standpoint, human, dog and horse contributions are deemed "controllable" sources and their contribution can and should be reduced. We can also see that dogs contribute at each site along with a 10% contribution from horses at the Felton site.

The County of Santa Cruz currently has a Proposition 13 contract (Prop. 13), "Identification and Characterization of Non-Point Sources of Pollution Affecting Santa Cruz County Beaches," however, the Prop. 13 contract does not include the area upstream of Branciforte Creek on the San Lorenzo River (all the stations shown above are upstream of the confluence with Branciforte Creek).

[2] An EPA drinking water grant, given to the County of Santa Cruz, paid for these samples. Results are still preliminary.

Table 2: Percent contribution of sources of *E. coli* bacteria in the San Lorenzo River

Source	**Sycamore Grove (SLR @ Sycamore Grove)**	**Felton (SLR @ Big Trees)**	**Boulder Creek (SLR @ River St)**
Avian	29%	23%	34%
Bovine	5%	1%	0%
Canine	6%	12%	9%
Feline	1%	1%	1%
Horse	1%	10%	1%
Human	21%	21%	26%
Rodent	9%	7%	5%
Unknown	17%	11%	10%
Wildlife	11%	15%	13%

What's next? San Lorenzo River rarely exceeds water quality objectives. Because the magnitude and frequency of exceedences are quite low, staff has three possible recommendations:

1. San Lorenzo River be designated a low or medium priority because there are other areas in the Santa Cruz area that seem to be violating bacterial water quality objectives on a more regular basis (e.g. San Lorenzo River Lagoon);
2. Continue to track the County of Santa Cruz's monitoring data and keep tabs on the situation to see if it is improving, staying the same or worsening. After a couple of years (2006 for example), evaluate data and determine if there is a change in water quality that more clearly indicates impairment or attainment of water quality objectives;
3. Move forward with a TMDL to pursue addressing coliform issues in San Lorenzo River because the DNA analysis has illustrated that humans, dogs and horses are contributors to the occasional exceedences of objectives. Because these sources can be controlled, the following schedule is proposed:

Phase 4: Preliminary Project Report. Numeric Targets and Source Analysis

Who	Regional Board staff – (S. Keeling) Stakeholders – Provide comments Assistance of GIS personnel in developing maps of the watershed
Action Steps & Schedule	• September 2004 - October 2004: Perform source analysis relating locations of target exceedences and determine probable pathogen sources causing exceedences. Complete Source Analysis based on existing DNA study[3]. Obtain maps (watershed and land use) of the area to aid in source tracking efforts. • November 2004: Summarize Numeric Targets and describe Source Analysis in written Progress Report
Cost (PY & $)	*Staff Resources:* FY 2004-05: 0.2 PY *Contract Resources:* DNA Analysis was furnished by an EPA Drinking Water Grant
Issues	• Stakeholders may request additional source assessment work • RB staff will utilize Basin Plan Bacteria Objectives as the numeric target. RB Basin Planning staff indicates they hope to have a new bacterial objective adopted by the Regional Board by fall or winter of 2004. TMDL will use whatever objective is in the Basin Plan.

Phase 5: Project Report

Who	Regional Board staff – (S. Keeling) Stakeholders: Stakeholder will review Project Report and provide comments
Action Steps & Schedule	• December 2004 - January 2005: Prepare a Project Report with TMDL, allocations, and corrective measures necessary to attain compliance with water quality standards. This plan will include an implementation and monitoring plan. • February 2005: Send to stakeholders for informal review and comments. • March 2005: Consider stakeholder comments and revise report if appropriate • April 2005: Prepare Project Report, including TMDL, allocations, implementation, and monitoring plan. Prepare other documents necessary for proposed regulatory action (i.e. resolution, CEQA documents, etc.) • May 2005 - October 2005: Obtain Scientific Peer Review (and other legal or technical review) and prepare response to comments
Cost (PY & $)	*Staff Resources:* FY 04-05: 0.3 PY FY 05-06: 0.1 PY *Contract Resources:* no RB3 contract money estimated at this time
Issues	None at this time.

Phase 6: Regulatory Action(s)

Who	Regional Board staff – (S. Keeling) Stakeholders: Stakeholder will review Preliminary Project Report to provide comments
Action Steps &	• November 2005 – Jan./Feb. 2006: Prepare documents for regulatory approval and present to Regional Board for Action

[3]Preliminary information can be found here but this Prop. 13 did not fund the DNA analysis. *Assessment of Sources of Bacterial Contamination at Santa Cruz County Beaches, Assessment and Evaluation Plan, Task 4, Monitoring and Reporting Plan, Task 5, Health Risk Study Plan, Task 7.1,* September 20, 2003, County of Santa Cruz, Health Services Agency, Environmental Health Service

Schedule	
Cost (PY & $)	*Staff Resources:* FY 05-06 0.1 PY *Contract Resources:* no RB3 contract money estimated at this time
Issues	None at this time.

Potential Future Activities (as needed)

Budget and Schedule Uncertainties:

Budget: short-term:

Long-term:

Schedule: